

What is claimed is:

1. An agent that modulates metalloprotease-mediated activation of latent myostatin, said agent comprising a peptide, wherein said peptide comprises a peptide portion of a myostatin polypeptide, or a derivative of said peptide portion, wherein the derivative of the peptide portion of the myostatin polypeptide comprises a peptide having a mutation of a cleavage site for the metalloprotease.

2. The agent of claim 1, wherein said agent reduces or inhibits metalloprotease-mediated activation of latent myostatin.

3. The agent of claim 1, wherein said agent increases metalloprotease-mediated activation of latent myostatin.

4. The agent of claim 1, wherein the peptide has an amino acid sequence of:

KDVIRQLLPKAPPLRELIDQYDVQRADSSDGSLEDDDYHATTETIITMPT
(SEQ ID NO:11);

QLLPKAPPLRELIDQYDVQRADSSDGSLEDDDYHATTETI (SEQ ID NO:14);

APPLRELIDQYDVQRADSSDGSLEDDDYHA (SEQ ID NO:17);

ELIDQYDVQRADSSDGSLED (SEQ ID NO:20); or

YDVQRADSSD (SEQ ID NO:23).

5. An agent of claim 1, wherein said agent is operatively linked to a second molecule.

6. An agent of claim 5, wherein the second molecule comprises a detectable label.

7. An agent of claim 5, wherein the second molecule comprises a heterologous polypeptide.

8. An agent of claim 7, wherein the heterologous polypeptide stabilizes the peptide.

9. An agent of claim 7, wherein the heterologous polypeptide comprises an Fc domain of an antibody.

10. An agent of claim 7, comprising a fusion protein.

11. An agent of claim 10, wherein said fusion protein comprises a peptide having an amino acid sequence as set forth in SEQ ID NO:11; SEQ ID NO:14; SEQ ID NO:17; SEQ ID NO:20; or SEQ ID NO:23.

12. An agent of claim 11, wherein said fusion protein comprises an operatively linked Fc domain of an antibody molecule.

13. An agent of claim 1, wherein said metalloprotease is a bone morphogenetic protein-1/tolloid (BMP-1/TLD) family member.

14. An agent of claim 13, wherein the BMP-1/TLD family member is BMP-1, TLD, tolloid-like protein-1 (TLL-1), or tolloid-like protein 2 (TLL-2).

15. An agent of claim 14, wherein the BMP-1/TLD family member is BMP-1, mammalian TLD (mTLD), mammalian TLL-1 (mTLL-1), or mammalian TLL-2 (mTLL-2).

16. A method of increasing muscle mass in a subject, said method comprising administration of the agent of claim 1.

17. A method of treating a metabolic disorder in a subject, said method comprising administration of the agent of claim 1.

18. The method of claim 17, wherein said metabolic disorder is a muscle wasting disorder.

19. The method of claim 18, wherein said muscle wasting disorder is associated with muscular dystrophy, including Duchenne muscular dystrophy; cachexia,

including cachexia associated with cancer or acquired immune deficiency syndrome; or sarcopenia, including age-related sarcopenia.

20. The method of claim 17, wherein said metabolic disorder is diabetes.

21. The method of claim 17, wherein said metabolic disorder is associated with obesity.